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fpanna@paulandpaul.com

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte KEITH C. HONG, HUSNU M. KALKANOGLU,
MING L. SHIAO, ANNE B. HARDY,
JAMES A. SALVATORE, and ANDREW G. JOHNSON, JR.

Appeal 2009-010445
Application 10/600,809
Technology Center 1700

Decided: February 17, 2010

Before ADRIENE LEPIANE HANLON, CHUNG K.PAK, and
PETER F. KRATZ, *Administrative Patent Judges*.

KRATZ, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 from the Examiner's final rejection of claims 4, 5, 7-14, and 39-50. We have jurisdiction pursuant to 35 U.S.C. § 6. Oral arguments were presented January 21, 2010.

Appellants' claimed invention is directed to a process for producing algae-resistant roofing granules wherein porous, inert base particles are formed from a mixture of stone dust and binder, an inorganic algaecide is provided on or within the base particles, the binder is insolubilized, and product granules are formed.

According to Appellants, it is known to render a roofing granule formed from a mineral material algae-resistant by providing a coating layer thereon, which coating layer includes an algaecide and a binder (Spec. 1-2). Appellants note that it is typical to use stone crushing and screening to obtain a suitable size of mineral material for use as a base granule to be coated in forming such an algae-resistant roofing granule (Spec. 2). According to Appellants, "it is difficult to control leaching [of an algaecide] from a thin coating, and the available biocide may dwindle to an ineffective level long before the anticipated life of the roof." *Id.*

Appellants disclose using mineral particles having an average particle size of from about 0.1 microns to about 40 microns that are said to be smaller than the typically acceptable size mineral material used in the prior art for Appellants' process of preparing roofing granules (Spec. 2 and 5). Appellants form (build-up) inert base particles that are porous from a mixture of these smaller size mineral particles and a binder in providing a suitably sized roofing granule mineral material, such as particles sized between 500 microns to 2 millimeters, from the mixture of the smaller size mineral particles and the binder (Spec. 2-3, 6). One source of the small mineral particles employed by Appellants is stone dust (Spec. 5). According to Appellants, "[s]tone dust is a natural aggregate produced as a by-product

of quarrying, stone crushing, machining operations, and similar operations" (Spec. 5).

Claims 39 and 44 are illustrative of the claimed process and are reproduced below:

Claim 39. A process for producing algae-resistant roofing granules, the process comprising:

(a) preparing porous, inert base particles from a mixture including stone dust and a binder;

(b) providing at least one inorganic algaecide on or within the base particles to form algaecide-bearing particles;

(c) insolubilizing the binder.

Claim 44. A process for producing algae-resistant roofing granules, the process comprising:

(a) preparing porous, inert base particles from a mixture including stone dust and from about 10 percent to 40 percent by weight of a binder comprising an aluminosilicate material;

(b) providing at least one inorganic algaecide within the base particles to form algaecide-bearing particles;

(c) insolubilizing the binder by firing the base particles in a kiln at a temperature of at least of from 800 degrees C to 1200 degrees C; the roofing granules having a porosity of between about 3 percent and 30 percent by volume.

The Examiner relies on the following prior art references as evidence in rejecting the appealed claims:

McMahon	3,507,676	Apr. 21, 1970
Skadulis	3,528,842	Sep. 15, 1970
Iwata	4,735,975	Apr. 5, 1988
Balcar	5,022,897	Jun. 11, 1991

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Joedicke	6,214,466	Apr. 10, 2001
Ryan	6,306,795	Oct. 23, 2001
Ina	JP 2002018358A	Feb. 2, 2002

Claims 4, 5, 7, 8, 13, 14, and 39-45 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Joedicke, Skadulis, or McMahon, in view of Ina, and Balcar. Claims 9-12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Joedicke, Skadulis, or McMahon, in view of Ina, Balcar, and Ryan. Claims 46-50 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Joedicke, Skadulis, or McMahon, in view of Ina, Balcar, and Iwata.

We reverse the stated rejections for reasons set forth in the Appeal Brief and Reply Brief.

PRINCIPAL ISSUE

Has the Examiner established that one of ordinary skill in the art would have been led to modify Joedicke, Skadulis, or McMahon by using stone dust and a binder, as here-claimed, to form particles (granules) suited for use in and for forming the algae-resistant roofing granules of Joedicke, Skadulis, or McMahon based on the teachings of Ina with respect to forming a road base material composite using lime-stabilized fine crushed rock powder together with the teachings of Balcar concerning sodium silicate used in collecting glass dust and capturing hazardous waste removed from a filter?

PRINCIPLES OF LAW

It is well settled that the Examiner bears the burden of establishing a *prima facie* case of non-patentability. *See In re Piasecki*, 745 F.2d 1468, 1472 (Fed. Cir. 1984).

“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR Int’l v. Teleflex, Inc.*, 550 U.S. 398, 417 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

FINDINGS OF FACT

On this appeal record, we adopt the Examiner’s findings of fact with respect to the teachings of Joedicke, Skadulis, and McMahon as set forth in the Examiner’s Answer, which findings are uncontested by Appellants (Ans. 3-4; *see generally* App. Br. and Reply Br.). While each of these references employ crushed rock granules in forming the algae-resistant roofing granules thereof, the Examiner acknowledges that “Joedicke/Skadulis/McMahon fails to teach that a stone dust produced after crushing and screening is reused by granulating a mixture containing the stone dust and a binder and insolubilizing the binder ...” (Ans. 4).

Ina¹ discloses the use of quick lime or lime-based stabilizer as an additive to fine rock powder to form a stabilized composite together with crushed rock/stone, which composite is useful as a road base material (Ina,

¹ Our references to the disclosure of Ina are to the English language Translation prepared by the McElroy Translation Company that is of record in the Application file.

para. 0003). Ina teaches that the aforementioned fine rock powder is generated in a wastewater treatment process subsequent to wet cleaning of crushed rock (Ina par. 0002).

The Examiner acknowledges that Ina does not teach the use of an insolubilizing binder (Ans. 5).

Balcar teaches a method for the removal and neutralization of hazardous waste including the step of coating a filter medium with glass dust carried by a gas stream such that the filter's capturing of hazardous waste materials carried in the gas stream is assisted by the glass dust coating (abstract). Balcar's glass dust and entrapped hazardous waste is removed from the filter and melted with added sodium silicate to combine the removed materials in an aggregate form that does not permit leaching of the hazardous waste therefrom (abstract, col. 3, ll. 49-60, col. 5, l. 41- col. 6, l. 27; Fig. 2). Also, Balcar discloses a testing protocol for forming neutralized amorphous hazardous waste-containing glass and notes that sodium silicate may be used as a liquid in a commercial scale operation to pre-agglomerate or pelletize dust so as to minimize entrainment of dust in the air and the inhalation hazard associated with such entrainment (Example 2; col. 8, ll. 23-28).

Based on these references, the Examiner maintains, at least in part, that:

[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to have recycled a stone fine powder produced after crushing and screening in Joedicke/Skadulis/McMahon by mixing it with a binder and granulating the mixture by compaction and agglomeration thereby preparing granules of desirable grain size from the stone fine powder, as taught by Ine [sic.] et al.

...

[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to have used an aqueous sodium silicate solution as a binder instead of lime in Joedicke/Skadulis/McMahon in view of Ine [sic.] et al with the expectation of providing the desired binding of mineral dust since Balcar et al teach that an aqueous sodium silicate solution can be used as an adhesive for binding a mineral dust. Note that sodium silicate would be insolubilized in a process of Joedicke/Skadulis/McMahon upon firing.

...

[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to have used an aqueous composition containing a major amount of sodium silicate solution and a kaolin clay (aluminosilicate) as a binder instead of lime in Joedicke/Skadulis/McMahon in view of Ine [sic.] et al in view of Balcar et al with the expectation of providing the desired binding of mineral dust since each of Joedicke/Skadulis/McMahon teaches that a composition containing a major amount of aqueous sodium silicate solution and kaolin (aluminosilicate) is suitable for binding to crushed mineral particles.

Ans. 5-6

ANALYSIS

Concerning the Examiner's first stated obviousness rejection, the Examiner basically takes the position that all of the rejected claims require a process for making algae-resistant roofing granules that is not taught by each of Joedicke, Skadulis, and McMahon because each of these applied references does not teach employing stone dust in admixture with a binder to form porous base particles, which admixed/agglomerate particles are used in

forming algae-resistant roofing granules, as the rejected claims require (Ans. 4, see claims 39 and 44).² To make up for these self-acknowledged shortcomings of the teachings of Joedicke, Skadulis, and McMahon with respect to Appellants' claimed process (see independent claims 39 and 44), the Examiner turns to Ina and Balcar.

However, as noted above, Ina is directed to stabilizing powdered rock fines, recovered from crushed rock cleaning wastewater, with lime-based material and blending the stabilized fines with other crushed rock to yield a composite material useful as a road base material; and, Balcar is directed to hazardous waste removal and neutralization, wherein glass dust particles are used to assist filtering hazardous waste from a gas, the dust and trapped hazardous waste are recovered and combined with a substance, such as sodium silicate, melted, and formed into a glass mass, which mass can be fritted and entraps the hazardous material in a manner that does not allow for leaching of the hazardous waste therefrom.

Here, the Examiner has not articulated how to bridge the gap formed by what the Examiner asserts is missing from the teachings of Joedicke, Skadulis, or McMahon with respect to the algaecide-resistant roofing granule preparation as required by Appellants' rejected claims, by furnishing a persuasive rationale that explains how the additional, but disparate, teachings of Ina and Balcar as highlighted above, would have led one of ordinary skill in the art, with a reasonable expectation of success, to the

² The Examiner does not separately address product claims 43 and 45.

claimed subject matter as advocated by Appellants (App. Br. 4-10; Reply Br. 1-6).³

In particular, we note that the Examiner has not reasonably articulated why Ina's teaching of using rock fines recovered from wastewater in combination with a lime based stabilizer and crushed rock to form a material for a road base coupled with Balcar's capture of hazardous waste with glass dust and the formation of a glass using sodium silicate therefrom, such that the hazardous material cannot be leached, would have directed one of ordinary skill in the art to consult these references to modify the algae-resistant roofing granule preparation methods of any of Joedicke, Skadulis, or McMahon. Moreover, even if these references were analogous, as explained by Appellants:

[i]f one of ordinary skill in the art combined the disclosures of the references cited by the Examiner in making this rejection, the presently claimed invention would not result. If sodium silicate were substituted for the lime binder used for stone dust by Ine [sic.] et al., and a toxic material were added as taught by Balcar et al., the resulting granules would be fused to give a continuous mass (or at least a continuous glassy matrix in which the stone dust particles were imbedded as a separate phase) and the mass would be comminuted to give a particulate, as taught by Balcar et al. The toxic material would be rendered harmless, and ineffective as an algaecide. There is nothing in this combination of references that would suggest to one of ordinary skill in the art that Balcar et al.'s express teaching that the glass particles be fused should be ignored. This must be gleaned from applicants' own disclosure, and thus by the Examiner own test (Examiner's Action date July 24, 2007, page 7, first full paragraph), the Examiner's rejection is simply an

³ The Examiner does not allege that any of Joedicke, Skadulis, or McMahon teaches or suggests using stone dust in making algae-resistant roofing granules.

improper hindsight reconstruction of the claimed invention. In re McLaughlin, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). Further, it is unclear how a refractory material like the stone dust could be fused in any conventional industrial process, as the combination would suggest. The Examiner has failed to make out a *prima facie* case of obviousness, and her rejection should be reversed for this reason as well.

In this regard, we note that each of Joedicke, Skadulis, and McMahon is concerned with providing roofing granules that are made so as to allow for the release of an algaecide from the granules at a slow rate during their exposure and application as part of a roofing shingle (*see generally* Joedicke, Skadulis, and McMahon), not for preventing the leaching of an algaecide. Moreover, while rocks may be crushed as part of forming the roofing granules of these references, the Examiner finds that Joedicke, Skadulis, and McMahon do not teach using stone dust and binder in forming base particles used in making algae-resistant roofing granules. The Examiner does not persuasively explain why the disclosure of Ina with respect to recovering stone dust from crushed rock cleaning wastewater in a form that makes it suitable for a road base, would, if combined with Joedicke, Skadulis, or McMahon, have led one of ordinary skill in the art in a direction different from that taught by Ina. That is, the Examiner has failed to explain why one of ordinary skill in the art would have used the stone dust in Ina, intended for making a road base material, to make a roofing material as in the process of Joedicke, Skadulis, and McMahon.⁴

⁴ The Examiner relies on rock crushing as a common feature for bringing each of Joedicke, Skadulis, and McMahon together with Ina, as analogous art; and, the Examiner relies on Ina for motivation in modifying the

Consequently, on this record, the Examiner's rejection falls short of making out a sustainable case of obviousness.

Concerning the Examiner's second and third stated obviousness rejections, the Examiner relies on the additional, but disparate teachings of Ryan (stable copper-containing catalyst) and Iwata (granular friction material), not for making up for any deficiency in the teachings of Joedicke, Skadulis, or McMahon in view of Ina and Balcar but for allegedly teaching features specified in the so rejected dependent claims. As such, the Examiner's second and third stated rejections are not sustainable substantially for the reasons we discussed above and as presented by Appellants in the Appeal Brief and Reply Brief.

CONCLUSION

On this appeal record, the Examiner has not discharged the burden to establish that one of ordinary skill in the art would have been led to modify Joedicke, Skadulis, or McMahon by using stone dust and a binder, as here-claimed, to form inert base particles (granules) as part of a process for making the algae-resistant roofing granules of Joedicke, Skadulis, or McMahon based on the disparate teachings of Ina with respect to forming grains sized for road pavement by lime-stabilizing fine crushed rock powder, and Balcar's alleged use of sodium silicate for collecting glass dust and capturing hazardous waste removed from the filter in pellet/aggregate form.

processes of Joedicke, Skadulis, and McMahon in the use of stone dust (Ans. 10; Final Office Action, pp. 4 and 5).

ORDER

The Examiner's decision to reject claims 4, 5, 7, 8, 13, 14, and 39-45 under 35 U.S.C. § 103(a) as being unpatentable over Joedicke, Skadulis, or McMahon, in view of Ina, and Balcar; to reject claims 9-12 under 35 U.S.C. § 103(a) as being unpatentable over Joedicke, Skadulis, or McMahon, in view of Ina, Balcar, and Ryan; and to reject claims 46-50 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Joedicke, Skadulis, or McMahon, in view of Ina, Balcar, and Iwata is reversed.

REVERSED

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sld

PAUL AND PAUL
2000 MARKET STREET
SUITE 2900
PHILADELPHIA PA 19103